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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/782,972	02/23/2004	Shiro Suyama	32307-201091	7722
26694	7590	01/23/2006	EXAMINER	
VENABLE LLP			SHENG, TOM V	
P.O. BOX 34385			ART UNIT	
WASHINGTON, DC 20045-9998			PAPER NUMBER	

2677

DATE MAILED: 01/23/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	Application No. 10/782,972	Applicant(s) SUYAMA ET AL.	
	Examiner Tom V. Sheng	Art Unit 2677	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 23 February 2004.
- 2a) ☐ This action is FINAL.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 23-31 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 23-31 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 23 February 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☒ Certified copies of the priority documents have been received in Application No. 08/784,353.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>2/23/04</u> . | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

### ***Claim Rejections - 35 USC § 112***

1. Claims 23, 29 and 30 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

As for claim 23, it is unclear as to the meaning of "static and vertical alignment", line 8, as to allow one of ordinary skill in the art to utilize the invention. In particular, please further qualify the claim as to the subject/object to be aligned and corresponding reference or criteria.

As for claim 29, it is unclear as to the meaning of "said plurality of optical devices being arranged in series so that the ordering directions of the respective alignment layers are perpendicular to each other", lines 2-3, as to allow one of ordinary skill in the art to utilize the invention. In particular, please provide the figure(s) and description on the limitation.

As for claim 30, it is unclear as to the meaning of "the variable refractive index material having a more uniform alignment", lines 2-3, as to allow one of ordinary skill in the art to utilize the invention. In particular, please provide the figure(s) and description on the limitation regarding variable refractive index materials having less uniform alignment and more uniform alignment, respectively.

***Claim Rejections - 35 USC § 102***

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 23, 25-28 and 30 are rejected under 35 U.S.C. 102(b) as being anticipated by Sakata (US 5,299,037).

As for claim 23, Sakata teaches an optical device (display element; fig. 1-3) comprising:

a layer of transparent material (material 1) having a desired curved surface configuration (having a triangular, rectangular or sinusoidal grating; column 3, lines 16-39);

a layer including a variable refractive index material (variable refractive index type material 2 using liquid crystal; column 4, lines 8-22) having a positive or negative dielectric constant anisotropy (it is inherent that for optically anisotropic liquid crystal material, the dielectric, optical and mechanical properties are dependent upon the direction of incident light; thus either a positive or negative type dielectric anisotropy);

at least two transparent electrodes (transparent electrodes 3) arranged to sandwich said layer of transparent material and said layer including the variable reflective index material (sandwiching materials 1 and 2 therebetween); and

a driving device (inherent in order to apply an electric field or voltage across the transparent electrodes 3; column 3, line 40 through column 4, line 7) for always

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supplying a voltage substantially equal to or greater than an amplitude of a voltage establishing static and vertical alignment in said variable refractive index material (as an electric field is applied, the optical axis of material 2 is changed in proportion to the magnitude of the electric field; thus, with a sufficient magnitude, the optical axis of material 2 could be made to be in alignment with the polarization component 6 of incident light 5. Note: initially without a field, the optical axis of material 2 is perpendicular to the polarization component 6.).

Note alternatively, material 1 could be considered as the variable refractive index material layer and material 2 could be considered as the transparent material layer because of layout symmetry.

As for claim 25, variable refractive index liquid crystal inherently has a nematic phase.

As for claim 26, the two transparent electrodes 3 are parallel with each other as shown.

As for claim 27, the interface between material 1 and material 2 is a diffraction grating and can also be regarded as a lens array or a lenticular lens.

As for claim 28, an alignment layer disposed on the transparent electrode adjacent the variable refractive index material is inherent in order to pre-align the liquid crystal molecules as the original alignment.

As for claim 30, Sakata's incident light 5 is incident upon material 1, which is a variable refractive index material (via a transparent electrode just as the instant invention).

***Claim Rejections - 35 USC § 103***

4. Claims 24 and 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sakata as applied to claim 23 above, and further in view of Toda et al. (US 5,047,847).

As for claim 24, Sakata does not teach driving the two transparent electrodes in an AC manner. Toda teaches an optical system, which comprises a liquid crystal lens having a refractive index anisotropy, responds differently to different frequencies (Abstract). In particular, the dielectric constant of the liquid crystal lens (LCA) responds to driving frequencies as shown (fig. 6; column 6, lines 31-45).

One of ordinary skill in the art would recognize the benefit of driving at a certain frequency in order to position the dielectric constant at a certain value. This is useful as by combining frequency and voltage in controlling the optical characteristics of the liquid crystal, it becomes possible to use either a smaller voltage or a narrower voltage range. Therefore, it would have been obvious to incorporate Toda's teaching of frequency control into Sakata's display device, because of above benefits.

As for claim 31, neither Sakata nor Toda teaches using a reflective electrode. On the other hand, it is well known in the art that liquid crystal display can be either transmissive or reflective and it would have been obvious to replace the back transparent electrode with a reflective electrode, when making a reflective type liquid crystal panel.

**Conclusion**

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tom V. Sheng whose telephone number is (571) 272-7684. The examiner can normally be reached on 9:00am - 6:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amr Awad can be reached on (571) 272-7764. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Tom Sheng  
January 9, 2006

AMR A. AWAD  
PRIMARY EXAMINER

